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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/579,614 | 07/19/2007 | Jan Cornelis De Jong | U 016907-4 | 4798 |

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| EXAMINER | |
|---|---|
| CHEN, STACY BROWN | |
| ART UNIT | PAPER NUMBER |
| 1648 | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/579,614 | DE JONG ET AL. | |
| | Examiner | Art Unit | |
| | Stacy B. Chen | 1648 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *13 May 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-12,15,16,20-34 and 41-57* is/are pending in the application.

4a) Of the above claim(s) *1-12,15,16,20-34 and 41-46* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *47-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 May 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9-22-06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. Applicant's election without traverse of Group VI, claims 13 and 14, is acknowledged and entered. Applicant's subsequent preliminary amendment filed May 13, 2009, added new claims 47-57, drawn to the elected invention. Claims 13 and 14 were cancelled. Claim 12 was amended to depend from claim 48, however, it encompasses an embodiment that was not elected, Group IV. In summary, claims 1-12, 15, 16, 20-34 and 41-57 are pending. Claims 1-12, 15, 16, 20-34 and 41-46 are withdrawn consideration being drawn to non-elected subject matter. Claims 47-57 are under examination.

### *Drawings*

2. The drawings are objected to because they do not recite sequence identifiers for each sequence. In lieu of amending the drawings, Applicant may amend the specification to include the identifiers in the "Brief Description of the Drawings" section. Correction is required.

### *Oath/Declaration*

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

> The oath or declaration is defective because:
> Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c).

Specifically, inventors James Simon and Albertus Osterhaus have changed their country of citizenship without having initialed and dated the alterations. This cannot be corrected by filing an application data sheet. A new declaration is required.

***Claims Summary***

4. The claims are drawn to a method for analyzing a sample. The method comprises the step of detecting the presence or absence of an EMCR-CoV virus in the sample. The specification does not appear to completely spell out the meaning of "EMCR-CoV", with the exception of its description as an essentially mammalian positive-sense single stranded RNA virus within the group of coronaviruses. In the acronym "EMCR-CoV", it appears that "EM" refers to "essentially mammalian", and "CoV" refers to coronavirus. However, the "CR" portion of the acronym is not clearly set forth in the specification.

The step of detecting the presence or absence of an EMCR-CoV virus in a sample comprises identifying a viral isolate in a sample that more closely phylogenetically corresponds to SEQ ID NO: 1 or a functional fragment thereof compared to PEDV, HCoV-229E, PRCoV, TGEV, CaCoV and FeCoV. More specifically, the sample is contacted with a nucleic acid primer or probe that is specific for the EMCR-CoV virus (or functional fragment thereof) that would only cause a reaction if EMCR-CoV is present in the sample. The primer or probe has at 65% or at least 85% complementarity to RNA of EMCR-CoV or the functional fragment thereof. The functional fragment that may be detected in the method comprises an open reading frame that encodes EMCR-CoV replicase, nuclear capsid, matrix or spike protein.

The sample is from a mammal, specifically a human with atypical pneumonia. Identification of EMCR-CoV leads to a diagnosis of EMCR-CoV infection.

### *Claim Objections*

5. Claims 47-55 are objected to because they recite the acronym, "EMCR-CoV" without explaining (either in the claims or the specification) how the letters of the acronym correspond to its meaning. In the acronym "EMCR-CoV", it appears that "EM" refers to "essentially mammalian", and "CoV" refers to coronavirus. However, the "CR" portion of the acronym is not clearly set forth in the specification. Clarification is required.

### *Claim Rejections - 35 USC § 112*

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 47-55 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is new matter rejection.

The claims, as amended by the preliminary amendment of May 13, 2009, introduce the phrase, "A method for analyzing a sample". While the specification contemplates the analysis of a virus in the context of phylogenetics, the specification does not appear to contemplate the analysis of a sample by detecting the presence or absence of EMCR-CoV. Appropriate correction is required.

7. Claims 51 and 52 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the use of primers and probes that are specific to EMCR-CoV, does not reasonably provide enablement for primers and probes that have at least 65% or 80% complementarity to RNA of the EMCR-CoV virus or a functional fragment thereof. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

The breadth of the claims encompasses the detection of EMCR-CoV using primers or probes that are specific for EMCR-CoV, yet have 65% or 80% sequence identity to SEQ ID NO: 1 (the full-length genome sequence of EMCR-CoV). The nature of the invention is the detection of EMCR-CoV using the well-known technologies associated with primers and probes. The state of the art with regard to EMCR-CoV is that it is a novel virus, whose full-length sequence (according to SEQ ID NO: 1) is unique compared to other known coronaviruses.

The problem that one of skill in the art would be expected to encounter with the instant methods, is that the use of a primer or probe with 65% or 80% sequence identity to SEQ ID NO: 1, would identify viruses that are not EMCR-CoV. For example, US Patent Application Publication 2006/0024668A1 discloses a coronavirus, HCoV-NL63, which is 27,553 nucleotides in length and shares approximately 99% sequence identity across certain regions of the genome with the coronavirus of this application, EMCR-CoV. A sequence alignment of a portion of HCoV-NL63 and EMCR-CoV (nt 26,096-27,229) is reproduced below. “Qy” is the HCoV-NL63 sequence; "Db" is EMCR-CoV.

```
Qy          1 ATGGCTAGTGTAAATTGGGCCGATGACAGAGCTGCTAGGAAGAAATTTCCTCCTCCTTCA 60
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26133 ATGGCTAGTGTAAATTGGGCCGATGACAGAGCTGCTAGGAAGAAATTTCCTCCTCCTTCA 26192

Qy         61 TTTTACATGCCTCTTTTGGTTAGTTCTGATAAGGCACCATATAGGGTCATTCCCAGGAAT 120
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26193 TTTTACATGCCTCTTTTGGTTAGTTCTGATAAGGCACCATATAGGGTCATTCCCAGGAAT 26252

Qy        121 CTTGTCCCTATTGGTAAGGGTAATAAAGATGAGCAGATTGGTTATTGGAATGTTCAAGAG 180
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26253 CTTGTCCCTATTGGTAAGGGTAATAAAGATGAGCAGATTGGTTATTGGAATGTTCAAGAG 26312

Qy        181 CGTTGGCGTATGCGCAGGGGGCAACGTGTTGATTTGCCTCCTAAAGTTCATTTTTATTAC 240
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26313 CGTTGGCGTATGCGCAGGGGGCAACGTGTTGATTTGCCTCCTAAAGTTCATTTTTATTAC 26372

Qy        241 CTAGGTACTGGACCTCATAAGGACCTTAAATTCAGACAACGTTCTGATGGTGTTGTTTGG 300
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26373 CTAGGTACTGGACCTCATAAGGACCTTAAATTCAGACAACGTTCTGATGGTGTTGTTTGG 26432

Qy        301 GTTGCTAAGGAAGGTGCTAAAACTGTTAATACCAGTCTTGGTAATCGCAAACGTAATCAG 360
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26433 GTTGCTAAGGAAGGTGCTAAAACTGTTAATACCAGTCTTGGTAATCGCAAACGTAATCAG 26492

Qy        361 AAACCTTTGGAACCAAAGTTCTCTATTGCTTTGCCTCCAGAGCTCTCTGTTGTTGAGTTT 420
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26493 AAACCTTTGGAACCAAAGTTCTCTATTGCTTTGCCTCCAGAGCTCTCTGTTGTTGAGTTT 26552

Qy        421 GAGGATCGCTCTAATAACTCATCTCGTGCTAGCAGTCGTTCTTCAACTCGTAACAACTCA 480
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26553 GAGGATCGCTCTAATAACTCATCTCGTGCTAGCAGTCGTTCTTCAACTCGTAACAACTCA 26612

Qy        481 CGAGACTCTTCTCGTAGTACTTCAAGACAACAGTCTCGCACTCGTTCTGATTCTAACCAG 540
              |||||||||||||||| ||||||||||||||||||||||||||||||||||||||||||
Db      26613 CGAGACTCTTCTCGTAGCACTTCAAGACAACAGTCTCGCACTCGTTCTGATTCTAACCAG 26672

Qy        541 TCTTCTTCAGATCTTGTTGCTGCTGTTACTTTGGCTTTAAAGAACTTAGGTTTTGATAAC 600
              |||||||||||||||||||||||||||||||| ||||||||||||||||||||||||||
Db      26673 TCTTCTTCAGATCTTGTTGCTGCTGTTACTTTGGCCTTAAAGAACTTAGGTTTTGATAAC 26732

Qy        601 CAGTCGAAGTCACCTAGTTCTTCTGGTACTTCCACTCCTAAGAAACCTAATAAGCCTCTT 660
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26733 CAGTCGAAGTCACCTAGTTCTTCTGGTACTTCCACTCCTAAGAAACCTAATAAGCCTCTT 26792

Qy        661 TCTCAACCCAGGGCTGATAAGCCTTCTCAGTTGAAGAAACCTCGTTGGAAGCGTGTTCCT 720
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26793 TCTCAACCCAGGGCTGATAAGCCTTCTCAGTTGAAGAAACCTCGTTGGAAGCGTGTTCCT 26852

Qy        721 ACCAGAGAGGAAAATGTTATTCAGTGCTTTGGTCCTCGTGATTTTAATCACAATATGGGG 780
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26853 ACCAGAGAGGAAAATGTTATTCAGTGCTTTGGTCCTCGTGATTTTAATCACAATATGGGG 26912

Qy        781 GATTCAGATCTTGTTCAGAATGGTGTTGATGCCAAGGGTTTTCCACAGCTTGCTGAATTG 840
              |||||||||||||||||||||||||||||||| ||||||||||||||||||||||||||
Db      26913 GATTCAGATCTTGTTCAGAATGGTGTTGATGCCAAAGGTTTTCCACAGCTTGCTGAATTG 26972

Qy        841 ATTCCTAATCAGGCTGCGTTATTCTTTGATAGTGAGGTTAGCACTGATGAAGTGGGTGAT 900
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      26973 ATTCCTAATCAGGCTGCGTTATTCTTTGATAGTGAGGTTAGCACTGATGAAGTGGGTGAT 27032

Qy        901 AATGTTCAGATTACCTACACCTACAAAATGCTTGTAGCTAAGGATAATAAGAACCTTCCT 960
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      27033 AATGTTCAGATTACCTACACCTACAAAATGCTTGTAGCTAAGGATAATAAGAACCTTCCT 27092

Qy        961 AAGTTCATTGAGCAGATTAGTGCTTTTACTAAACCCAGTTCTATCAAAGAAATGCAGTCA 1020
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      27093 AAGTTCATTGAGCAGATTAGTGCTTTTACTAAACCCAGTTCTATCAAAGAAATGCAGTCA 27152
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Qy        961 AAGTTCATTGAGCAGATTAGTGCTTTTACTAAACCCAGTTCTATCAAAGAAATGCAGTCA 1020
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      27093 AAGTTCATTGAGCAGATTAGTGCTTTTACTAAACCCAGTTCTATCAAAGAAATGCAGTCA 27152

Qy       1021 CAATCATCTCATGTTGCTCAGAACACAGTACTTAATGCTTCTATTCCAGAATCTAAACCA 1080
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      27153 CAATCATCTCATGTTGCTCAGAACACAGTACTTAATGCTTCTATTCCAGAATCTAAACCA 27212

Qy       1081 TTGGCTGATGATGATTCAGCCATTATAGAAATTGTCAACGAGGTTTTGCATTAA 1134
              ||||||||||||||||||||||||||||||||||||||||||||||||||||||
Db      27213 TTGGCTGATGATGATTCAGCCATTATAGAAATTGTCAACGAGGTTTTGCATTAA 27266
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If one were to use a probe or primer that is not specific to EMCR-CoV, one would very likely identify a virus such as HCoV-NL63. Therefore, the use of primers or probes that are not specific to EMCR-CoV are not expected to uniquely identify EMCR-CoV.

In view of the breadth of the claims (probes and primers that are not unique to EMCR-CoV), the nature of the invention and the state of the art (HCoV-NL63 is approximately 99% identical to EMCR-CoV), it would require undue experimentation to practice the methods embodied in claims 51 and 52.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 48-57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The methods claimed in claims 48 and 54 comprise the identification of a viral isolate that “more closely phylogenetically corresponds to SEQ ID NO: 1 or a functional fragment than it does to a viral isolate from a different coronavirus”. The phrase “more closely phylogenetically corresponds" is relative and lacks comparative basis. Applicant has not

identified which parameters qualify as determinants of whether the isolate more closely phylogenetically corresponds to SEQ ID NO: 1 than it does to a different coronavirus.

Further, with regard to claims 48-57, a "functional fragment" of SEQ ID NO: 1 has not been defined in terms of its function. While fragments of SEQ ID NO: 1 can be determined, fragments that are "functional" cannot be determined without knowing the function that the fragment must possess.

***Conclusion***

9. No claim is allowed.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Application Publication 2006/0024668A1 discloses a coronavirus, HCoV-NL63, which is 27,553 nucleotides in length and shares approximately 99% sequence identity with the coronavirus of this application, EMCR-CoV. The 102(e) date for the 2006/0024668A1 patent application publication is January 7, 2004, the filing date of the provisional application 60/535,002, which discloses the HCoV-NL63 genome in full. Since Applicant's foreign application EPO 03078772.5 (filed December 1, 2003) discloses the full-length sequence of EMCR-CoV, the 2006/0024668A1 patent application publication cannot be used as prior art against the instant invention.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stacy B. Chen whose telephone number is 571-272-0896. The examiner can normally be reached on M-F (7:00-4:30). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Nickol can be reached on 571-272-0835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Stacy B Chen/
Primary Examiner, Art Unit 1648